

Environmental Cooperative Agreement Summary

This Environmental Cooperative Agreement (ECA) provides the structural framework for Cook Composites and Polymers Co. (CCP) and Wisconsin Department of Natural Resources (DNR) to prioritize and focus their resources to evaluate the feasibility of a waste minimization project to recover xylene from five million pounds of a characteristically hazardous wastewater and cease incineration of hazardous waste.

CCP committed to cease burning hazardous waste in its incinerator on or before September 30, 2001. CCP also committed to establish an environmental management system (EMS), and seek other opportunities for waste minimization, pollution prevention, product stewardship and other environmental benefits at the CCP Saukville, Wisconsin facility in cooperation with its neighbors, its customers, the local community and DNR.

ECA Background Information

The CCP Saukville facility manufactures polyester and alkyd resins used in a variety of applications including the coatings, sanitary, automotive and marine industries (SIC 2821 and 2851). The facility, located approximately 25 miles north of Milwaukee, began resin production in 1949 and employs approximately 60 full-time staff in Wisconsin.

CCP acquired the Saukville facility and other assets in December 1990 from Freeman Chemical Corporation. CCP is a joint venture of TOTAL COMPOSITES INC., which is a subsidiary of the international energy company TOTAL S.A. (TOTAL) based in Paris, France and Curran Composites Inc. of Kansas City, MO. CCP operates in the Resins Division of the Chemical Branch of TOTAL.

The CCP Saukville current production is approximately 50 million pounds of resin per year, produced in up to 3000 batches or blends. Waste streams generated at the facility consist primarily of reaction water, spent azeotrope and rinse solvents, filter cleaning residues, and miscellaneous off-specification materials. Prior to the ECA, the facility historically disposed of two of the primary waste streams (reaction water and solvent) using an onsite RCRA-permitted hazardous waste incinerator.

Baseline Environmental Performance

In 2000, the CCP Saukville facility **generated approximately five (5) million pounds of a characteristic hazardous waste stream known as “esterification water”**, or more commonly **“reaction water”**. The reaction water is a by-product of a condensation reaction of organic acids and glycol that yields polyester and alkyd resins.

The reaction water waste stream was incinerated on site in a facility permitted under the Resource Conservation and Recovery Act (RCRA). The reaction wastewater stream is classified as characteristically hazardous for ignitability (US EPA Code D001) due to the presence of low concentrations (<1%) of chemicals, primarily xylene. The reaction wastewater would at times exhibit a flash point below 140 degrees F, presenting a fire risk. The waste is also potentially acidic and may be classified as characteristically hazardous for corrosivity (US EPA Code D002) due to low pH (<2 units).

In 2000, the CCP Saukville facility **generated approximately 1.8 million pounds of spent xylene solvent (F003) waste** that was treated and disposed by the incinerator. Since the solvent was used as supplemental fuel to incinerate reaction water, the alternative of recycling the solvent was historically not considered economically attractive or important.

Additional environmental performance data tables for the baseline year 2001 through 2005 are included in Attachments [1a](#), [1b](#) and [1c](#). The tables and charts include a summary of air emissions, waste data, and water discharges that are also reported in the annual Toxic Release Inventory (TRI) reports and available on the WDNR FACTS database. Additional data on natural gas consumption, electricity use, and water use were included in these tables and charts.

ECA TARGETS AND RESULTS

Regarding Commitment to Regulatory Schedule

CCP recognized the economic, environmental, and community relations benefits associated with moving to waste minimization and pollution prevention approach for management of its hazardous wastes. The primary challenge was to synchronize the CCP technical and business evaluation of waste minimization and pollution prevention options with the regulatory requirements and regulatory review of Wisconsin DNR and U.S. EPA staff from many different environmental programs.

All regulatory reviews were completed in a timely manner and this allowed CCP to meet its target for ceasing hazardous waste incineration.

Regarding Cost Savings from Regulatory Flexibility

CCP revised and updated the incinerator Hazardous Waste Facility Feasibility and Plan of Operation Report (FPOR) according to the schedule in the DNR “call-in” letter. CCP did not request waste stream changes in the updated FPOR.

As a result, CCP was not required to provide a new trial burn test for the remaining period of operation. CCP saved an estimated \$400,000 of consultant and contractor direct costs, and hundreds of hours of CCP staff time. A trial burn test is normally conducted prior to licensing a facility, or as part of a 10-year permit renewal approval.

The WDNR also saved a considerable amount of staff time because WDNR staff were not required to review work plans and tests for a CCP facility that was about to close.

Regarding Waste Minimization and Pollution Prevention

Recovery of Xylene with Macro Porous Polymer Extraction (MPPE)

CCP evaluated the viability of waste minimization and pollution prevention options for management of reaction water at the Saukville facility, and other CCP facilities in the United States. CCP commissioned a pollution prevention study specifically focused on recovery of the ignitable constituent xylene from the reaction water.

The purpose of the study was to evaluate options for reducing hazardous waste generated by eliminating the hazardous characteristics of the water. The reaction water study focused on a new, Macro Porous Polymer Extraction (MPPE) technology developed by Akzo Nobel Inc. CCP also considered beneficial use of recovered xylene from reaction water, as well as the waste azeotrope xylene and rinse xylene.

CCP committed to and implemented the MPPE technology and ceased the burning of hazardous waste in its incinerator by September 30, 2001. This was two years before it would be required to do so under regulations promulgated by the US Environmental Protection Agency (US EPA). CCP received approval from WDNR for RCRA Closure of the CCP hazardous waste incinerator in June 2002.

Glycol Recovery from Reaction Water by Distillation

As reported previously, CCP also commissioned [a study of the recovery of glycol from reaction water](#) using the Research and Development (R&D) resources of its majority partner, TOTAL (Cray Valley) based in Paris, France.

The study considered current treatment and separation techniques to treat or recover glycol from reaction water. The feasibility study considered available technologies, including the demonstrated practice of distillation of glycol at a Cray Valley (Spain) facility. The study concluded that the economic effect of increased energy consumption of separating glycol from reaction water could not justify glycol recovery at CCP Saukville.

CCP reported to the Community Advisory Committee meetings in July and October 2002 that the recovery of glycol was not economically feasible for CCP at this time. CCP also noted that the implementation of on site glycol recovery could negatively affect the reliability of the thermal oxidizer, resulting in an increase in unplanned shutdowns and associated odors. CCP experienced such problems at another location.

Reaction Water Treatment by Photocatalysis

As reported previously, CCP was awarded a grant from *Wisconsin Focus on Energy* to fund research at UW-Madison on the photocatalysis of VOCs in reaction water. If trace levels of odor causing semi-volatile compounds could be selectively destroyed, the glycol/water would be more amenable to distillation recovery of glycol. The University of Wisconsin Chemical Engineering Department completed this study in 2003. Unfortunately, the esterification water was resistant to photocatalysis treatment due to the high glycol concentration.

Reaction Water Pre-Treatment and Wastewater Discharge to POTW

In the development of the ECA, CCP considered the potential for future pre-treatment and discharge of reaction water to a Publicly Owned Treatment Works (POTW). The ECA included provisions for a Baseline Monitoring Report (BMR) and submittal of the Plans and Specifications (P&S) for wastewater pre-treatment approval by WDNR .

However, the US EPA Region V permit engineers ultimately defined the regulatory classification of reaction water treatment as a Totally-Enclosed Treatment Facility (TETF). Therefore, the pre-treatment approval for the non-hazardous wastewater incinerator was no longer necessary since it was not regulated as a industrial wastewater pre-treatment source.

CCP included the operation of the non-hazardous incinerator in its air operating permit application. This air permit was issued in November 2003.

CCP currently has no plan to directly discharge to the Village of Saukville POTW. Therefore, the development of BMR and P&S documents is no longer a necessary element for the ECA.

Xylene Waste Minimization

CCP continues work on xylene source reduction opportunities as part of its Environmental Management Program (EMP) teams. An EMP is an environmental continual improvement team project that is a basic element of a facility EMS.

Segregation of the solvent waste streams of **azeotrope solvent** (used for removal of water by-product during a resin cook) from the **rinse solvent** (used to clean reactor vessels, tanks, and piping) was completed with an August 2002 tank installation project.

The use of azeotropic solvent in resin production was reduced by segregating solvent from decanters and reusing the solvent in subsequent batches. This solvent, when spent, must be shipped for beneficial reuse / fuel blending since the odor of the solvent makes it unsuitable for a recycle and return program.

CCP implemented a new program to recycle and return rinse xylene with an off site service. CCP managed approximately 510,000 pounds of xylene through recycling and return in 2005.

CCP evaluated the feasibility of on-site xylene recycling using an agitated thin film evaporator (ATFE) in 2002. The ATFE is the only recycling technology appropriate for solvent-resin mixtures due to their high viscosities. The estimated payback period of two to three years for this potential investment is not competitive because a cost-effective and local off-site recycling service is available. In addition, CCP water-borne product development plans will result in continued reduction in the xylene usage. Future reduction in usage diminishes the return on investment.

Regarding Community Relations and Stakeholder Involvement

Community Advisory Committee

1. CCP established an ongoing Community Advisory Committee (CAC) to involve stakeholders within the community, including:
 - Neighbors,
 - CCP Employees,
 - Area businesses,
 - Local elected and appointed officials,
 - Environmental groups
 - School officials and parents
 - University faculty
 - DNR staff,
 - Local Emergency Planning Committee,
 - Public Works Department,
 - Fire Department,
 - Citizen groups,
 - Neighborhood associations,
 - Others in the greater Saukville area who may be affected by or interested in the CCP facility and its activities.
2. The CCP CAC met quarterly at CCP from January 2001 through the end of 2003. In 2004, the CAC agreed to revise its schedule and meet on a semi-annual basis (e.g. April and October), unless specific issues require more frequent meetings. In 2005, the CAC met in January, May and October. Meetings are open to the public, and public comment is accommodated at a set time on each agenda.
3. CCP maintains an updated list of the individuals participating on the Community Advisory Committee (CAC). CCP provides an updated committee membership list and other information including agendas and meeting summaries to members of the CAC, the DNR, and the Saukville Public Library.
4. CCP was recognized by the Wisconsin Environmental Initiative in the 2005 “Green & Growing” bus tour. The tour visited facilities across Wisconsin that have employed innovative approaches to environmental performance improvement.
5. CCP was invited to participate in a panel for the 2005 US EPA / Environmental Council of the States (ECOS) Innovation Symposium. The scope of the panel was to share business drivers for environmental improvement and sustainable development.
6. CCP presented its Saukville experience at the 2005 TOTAL Sustainable Development Seminar in Paris, France. CCP was recognized for its efforts by TOTAL in the No. 2 issue of the ACTIONS Newsletter ([Attachment 2](#)).

Other Community Outreach Activity

CCP committed to provide additional opportunities for information exchange and dialogue with the community through implementation of its outreach plan including:

- I. CCP continues its newsletter ([CCP EnviroNews](#)) that is used to regularly communicate with the advisory committee, and stakeholder residences, Saukville businesses, employees, and others who indicate an interest in CCP and its environmental performance.
- II. CCP conducted a plant tour for the CAC and any interested members of the general public in the fall meeting of 2005.
- III. CCP conducts a Community Survey *biennially*, a change from the original ECA based on community feedback. The survey is used to gauge public perception of CCP environmental performance changes. The Community Survey was conducted in 2000, [2002](#), and 2004. The results of the 2004 Community Survey were shared with the CAC at the January 2005 meeting and mailed to other stakeholders.
- IV. On alternating years to the Community Survey, CCP conducts a Community Advisory Committee Survey targeted at its major stakeholders. The 2005 survey summary prepared by the facilitator, Mr. Steve Skavroneck is included as [Attachment 3](#)).
- V. CCP received the **2005 TOTAL Resin Division *Prix de L'Innovation*** for Health, Safety and Environmental (HSE) innovation for its Community Dialogue system.
- VI. CCP updated the CAC on the following capital improvement projects:
 - Process tanks to increase CCP production of water-based products
 - Alarm system improvements to reduce noise pollution
 - CCP Noise Survey Measurements
 - Pavement of the employee parking lot to reduce dust and improve stormwater
 - Installation of Sparkler™ filter to reduce fugitive emission and odor
 - Plans for closing the solid non-hazardous waste incinerator
 - Updates regarding the non-hazardous liquid incinerator
 - Plans for a dedicated drum handling, filling and storage facility

Regarding Implementation of Environmental Management Systems

From 2002 through 2005, CCP implemented an integrated management system, known as AIMS, that includes environmental elements based on the standards for environmental management systems issued by the International Organization for Standardization (ISO).

CCP used an audit software entitled SUMMIT™ that was developed in partnership by TOTAL and Det Norske Veritas (DNV) to support this deployment. DNV is an internationally recognized registrar for ISO 9001 and ISO 14001 standards.

AIMS integrates Quality, Safety and Environmental (QSE) management systems, as well as Responsible Care™ Codes and OSHA Process Safety Management requirements into a comprehensive management system and auditing framework.

Registration Audit Plans – ISO 14001 / AIMS / ISRS

CCP completed an ISO 14001 pre-assessment audit with DNV in August 2005 and its ISO 14001 Registrar Audit in September 2005. Delays in the audit schedule were encountered while DNV trained and developed auditors capable of auditing an integrated QSE management system for CCP.

CCP successfully completed its integrated registration audit in September 2005. Several DNV auditors observed this audit since it was the first integrated audit of its type that DNV had conducted in the United States.

CCP was rated as a LEVEL 8 according to the International Safety Rating System (ISRS). CCP also received ISO 14001 Certification for the Saukville facility.

Other Management System Activity

CCP continues application of management systems for Product Stewardship and Transportation Management in the context of the industry initiative of [Coatings Care™](#) of the National Paint and Coatings Association (NPCA).

Regarding Progress to Superior Environmental Performance

Progress for CCP Saukville

As part of the commitment to Superior Environmental Performance, CCP committed to going beyond what would otherwise be required in environmental regulations by setting the following goals for its Saukville facility:

- I. Through waste minimization and pollution prevention, eliminate or significantly reduce the waste streams that were previously burned in its hazardous waste incinerator without transferring them to another environmental media.
 - ✓ Through its waste minimization efforts CCP ceased the incineration of nearly seven million pounds of hazardous waste annually. Every post-MPPE wastewater batch since September 30, 2001, successfully met the criteria for non-hazardous wastewater with measured flash point of greater than 200 F, and for corrosivity with pH greater than 5 to 6.
 - ✓ The results of the MPPE system xylene recovery efficiency are included as [Attachment 3](#). The system attained xylene removal efficiency averaging approximately 90% in 2005, and higher than 99% in some sampling during operating years 2001 through 2005. CCP continues efforts on improvement of MPPE operating consistency.
 - ✓ **Source reduction** resulted in a substantial decline in xylene use as shown in Table 2. Source reduction efforts included reducing rinse volumes, segregation and reuse of rinse or azeotrope xylene, and production shift by CCP toward water-based polymer dispersions.
 - ✓ CCP **recycled for reuse** approximately 510,000 pounds of spent xylene rinse solvent in 2005 using off-site distillation and return.
 - ✓ CCP **recycled for reuse** approximately 380,000 pounds of spent glycol generated from its scrubber system and reactor cleaning in 2005. CCP used off-site vendors for this recycling. In 2004, CCP recycled 550,000 pounds, but source reduction measures reduced the amount recycled in 2005.
 - ✓ CCP managed 1,160,000 pounds of xylene solvent waste through **off-site beneficial reuse (energy recovery)** in 2005. CCP solvent is a cleaner fuel alternative for cement kilns compared to heavy fuel oils or other hazardous waste, resulting in reduced emissions by the user. US EPA refers to these wastes as “**comparable fuels**” because they are cleaner to burn than fuel oil.

Progress for CCP Saukville (Continued)

- II. To establish a long-term reduction in the amount of wastes generated and contaminants and pollutants released giving priority to those pollutants, contaminants and wastes of highest health and environmental concern (SEE ABOVE, AND TABLE 1 & 2)
- III. Through implementation of the CCP EMS, continuously improve CCP practices to minimize environmental impacts and conserve natural resources and to work cooperatively with its neighbors, the local community, its customers, and others.
- IV. To take leadership in Product Stewardship, integrating environmental considerations into the design and development of products.
 - ✓ CCP led the commercial development of low-styrene (low HAP) composite resins.
 - ✓ CCP low-VOC resins (LOVOCOR™) and low-HAP (Styrene) and MACT-compliant resins (MC™ Series) are industry technology leaders.
 - ✓ CCP helped customers meet MACT requirements over one year before regulatory deadlines using pollution prevention by low-HAP product substitution, rather than pollution control.
 - ✓ Use of CCP low-HAP resin and gel coat resulted in a reduction of over 110,000 pounds (55 tons) of hazardous air pollutant (HAP) emission from open molding in Wisconsin in 2005. The HAP in these applications are styrene and methyl methacrylate.
 - ✓ CCP developed water-based acrylic-modified alkyd dispersions used in water-based coatings and wood stains. The development of products using the water-based dispersion technology contributed to a substantial reduction in xylene use at CCP Saukville as shown in Table 2.
 - ✓ CCP continues growth and development of a successful product line of aqueous cleaners **Thermaclean™** and no-HAP and low VOC emission solvent cleaners **Unisolve™** for use in the composites fabrication industry.

TABULATED RESULTS OF POLLUTION PREVENTION PROGRESS

TABLE 1 - XYLENE WASTE MINIMIZATION (Source Reduction & Recycling)

Year	Production (lbs / year)	Spent Xylene (lbs / year)	XyleneCost Savings from Recycling (\$ / year)	Solvent Incinerated (lbs / year)	Solvent Recycled (lbs / year)	Beneficial Reuse - Fuel (lbs / year)
2000	51,200,000	1,774,000	0	1,774,000	0	0
2001	53,100,000	1,730,500	0	1,300,000	80,500	350,000
2002	53,000,000	1,570,000	\$90,000	0	230,000	1,340,000
2003	53,700,000	1,730,000	\$145,000	0	370,000	1,360,000
2004	60,000,000	1,900,000	\$175,000	0	450,000	1,400,000
2005	52,700,000	1,670,000	\$185,000	0	510,000	1,160,000

Xylene Cost Savings from Recycling = (lbs. Recycled x \$/lb. Purchase) - (lbs. Recycled x \$/lb. Recycled)
+ (Disposal Cost Eliminated: gal x \$/gal)

TABLE 2 - XYLENE USE (2000 – 2005)

Manufacturing Year	Production (lbs)	Xylene Purchased (lbs)
2000	51,200,000	4,080,000
2001	53,100,000	3,200,000
2002	53,000,000	2,940,000
2003	53,700,000	2,530,000
2004	60,000,000	2,611,000
2005	52,700,000	2,597,000

Xylene numbers include recycled solvent. Reduced use also reflects the continued production shift by CCP to water-based polymer dispersions.

ATTACHMENT LIST

Attachment 1a – Air Emission and Production Trends

Attachment 1b – Energy and Water Use Trends

Attachment 1c – Waste Management and Recycling Trends

Attachment 2 – TOTAL *ACTIONS* No. 2 – Corporate Social responsibility and Sustainable Development Newsletter

Attachment 3 – 2005 Community Advisory Committee Survey Summary